

until a properly configured key 100 is fully inserted in the keyway 36. If a key 100 is cut by conventional means so that it operates the tumblers 28 of the cylinder lock 10, it will still not open the lock 10 since the locking bar 16 provides a second locking function that is independent of the tumblers 28. Additionally, since the key 100 includes novel structure for operating the cylinder lock 10, it provides a second layer of protection against unauthorized key duplication. Thus, the invention provides an increased measure of security not found in conventional cylinder locks 10.

As illustrated in FIG. 16, the locking bar 16 can be formed in various lengths to provide for numerous different secondary locking options with a single keyway design. Particularly, the protruding portion 106 on the key 100 and the length of the locking bar 16 can be cooperatively varied to create a plurality of different keys for fitting a single keyway. This allows a single keyway design to be modified to provide security for various different users.

Although the invention has been described with reference to the preferred embodiment illustrated in the attached drawing figures, it is noted that equivalents may be employed and substitutions made herein without departing from the scope of the invention as recited in the claims. For example, although the invention described herein generally relates to an improvement for a standard pin tumbler cylinder, the description and illustrations of this invention are depicted in the embodiment of a special type of pin tumbler cylinder commonly known to those skilled in the art as an interchangeable core cylinder. This interchangeable core is designed with a second shear line and respectively requires a second key to turn the cylinder plug and control sleeve simultaneously, thus retracting a portion of what is known as the control sleeve allowing easy installation and removal of the cylinder in a variety of cylinder housing designs for various applications. Since this interchangeable core type of cylinder is described in the prior art, the special details of operation will not be covered here. This improvement may also be applied to conventional pin tumbler mechanisms as well as other types of tumbler mechanisms.

Having thus described the preferred embodiment of the invention, what is claimed as new and desired to be protected by Letters Patent includes the following:

1. A cylinder lock comprising:

an elongated lock shell having opposed axial front and rear ends and a hollow plug-receiving chamber extending therebetween, said rear end including a notch formed therein;

an elongated cylinder plug rotatably received within said plug-receiving chamber, said plug including opposed axial front and rear ends and a hollow keyway extending therebetween for receiving a key blade, and

a hollow slot radially spaced from and extending parallel to said keyway, said slot having an opening adjacent said plug rear end, said opening being in alignment with said lock shell notch when said cylinder plug has not been rotated within said plug-receiving chamber, said slot further having a side opening in communication with said keyway; and

an elongated locking bar reciprocally mounted in said hollow slot, said locking bar including a first end extending from said slot opening and normally received within said lock shell notch for preventing rotation of said cylinder plug within said plug-receiving chamber, and

a second end axially opposed from said first end and including a protruding portion protruding into a portion of said keyway, wherein the insertion of a key having a protruding surface on one side thereof in said keyway engages said protruding portion of said locking bar and shifts said locking bar towards said cylinder plug rear end so that said first end of said locking bar is shifted out of said notch for permitting rotation of said cylinder plug within said plug-receiving chamber.

2. The lock cylinder as set forth in claim 1, said cylinder plug further including spring means for normally biasing said locking bar first end into said shell notch.

3. The lock cylinder as set forth in claim 2, said locking bar first end including a rear finger portion extending transversely from the locking bar longitudinal axis for engaging said lock shell notch.

4. The lock cylinder as set forth in claim 2, said locking bar first end further including a shoulder portion for engaging said cylinder plug rear end when said locking bar is shifted along said slot by a key placed in said keyway for limiting the travel of said locking bar out of said hollow slot opening.

5. A key for use in combination with a cylinder lock as defined in claim 1 for operating the cylinder lock, said key comprising:

a bow; and

an elongated key blade including

a proximal end attached to one end of said bow,

a distal end,

a pair of opposed edges extending between said proximal and distal ends, and

a pair of side margins interconnecting said edges,

one of said side margins including a protruding surface extending therefrom for engaging the locking bar of the cylinder lock and shifting the locking bar in the slot when said key is inserted in the keyway of the cylinder lock.

6. The key as set forth in claim 5, one of said edges including a series of projections extending therefrom for operating the tumblers of the cylinder lock.

7. The cylinder lock as set forth in claim 1, said protruding portion of said second end of said locking bar comprising a front finger portion extending transversely from said slot side opening and protruding into a portion of said keyway.

8. A locking apparatus comprising:

a cylinder lock including a keyway, a set of tumblers, an elongated hollow slot radially spaced from and extending parallel to the keyway and a secondary locking bar reciprocally mounted in the slot; and

a key for operating said cylinder lock, said key including a bow, and an elongated key blade, said key blade including

a proximal end attached to one end of said bow,

a distal end,

a pair of opposed edges extending between said proximal and distal ends, and

a pair of side margins interconnecting said edges,

one of said side margins including a protruding surface extending therefrom for engaging said locking bar of said cylinder lock and shifting said locking bar in said slot when said key is inserted in said keyway of said cylinder lock.